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ABSTRACT

This course guide for an industrial crafts course is one of four developed for the production area in the North Dakota senior high industrial arts education program. (Eight other guides are available for two other areas of Industrial Arts--energy/power and graphic communications.) Part 1 provides such introductory information as a definition and instructional objectives for Industrial Arts. Part 2 contains the course rationale and objectives; guidelines for implementation; taxonomic structure; course description including length, credit, prerequisites, and student competencies; suggested instructional units with required number of class periods; and five units. Each unit includes some or all of the following material: unit objective(s), topic outline, and selected student competencies to be developed through sample coordinated learning activities. Unit titles are Craft Industry, Craft Planning and Design, Materials and Processes, Materials Selection, and Craft Materials Areas. (A reference list is appended.) (YLB)

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INDUSTRIAL CRAFTS

(PRODUCTION)

INDUSTRIAL ARTS SENIOR HIGH--LEVEL II

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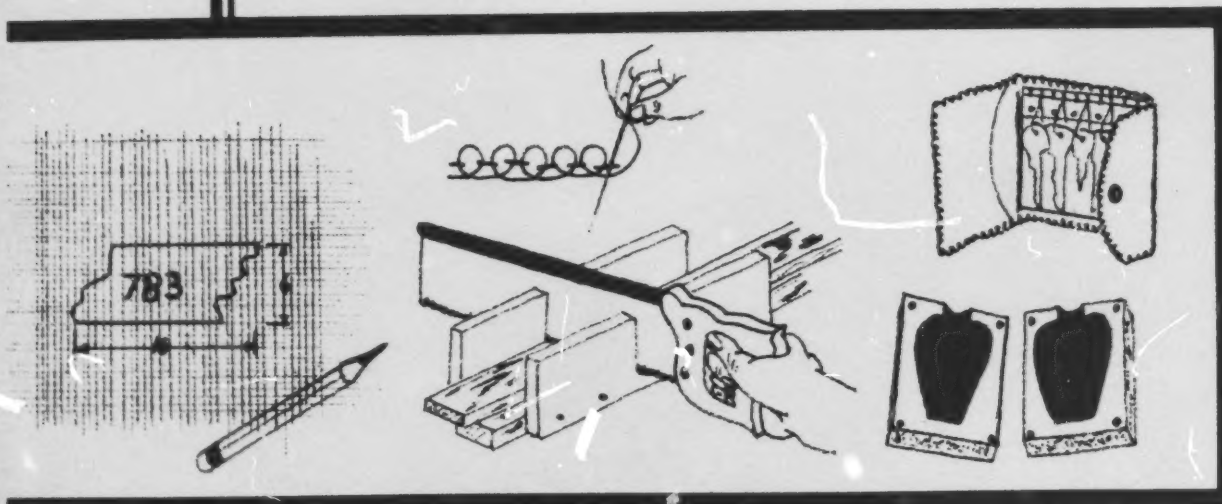
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NORTH DAKOTA STATE BOARD FOR
VOCATIONAL EDUCATION
Bismarck, North Dakota

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NORTH DAKOTA SENIOR HIGH INDUSTRIAL ARTS CURRICULUM GUIDES

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PREFACE

One of the biggest challenges facing education today is keeping the instructional content current. Industrial Arts in particular must be quick to respond to changes in our technological society. For many years, North Dakota has offered quality industrial arts programs to students in the public schools. Credit for this is due to the teachers who have shown the desire to continually improve programs, keep their content current, and make instruction relevant.

The Industrial Arts curriculum has boundless potential for courses and program development. However, this program possibility excites the imagination of teachers to offer endless number of courses which causes a need to determine what is of greatest value for students to experience.

Thus, the development of an appropriate or model curriculum requires a critical examination of several undergirding questions: What is the overall responsibility of Industrial Arts? What Industrial Arts goals are appropriate for the different grades or school levels? What courses constitute a meaningful curriculum for these goals to be realized? What shall be the scope and sequence of the total curriculum? The answers to these questions have been addressed by a North Dakota Industrial Arts Master Plan curriculum committee and are recorded in the North Dakota Senior High Industrial Arts Program of Studies booklet.

The Program of Studies describes the complete secondary school industrial arts education. The Program of Studies Booklet emphasizes the Level II Senior High programs with specific courses, course descriptions, objectives and units of instruction. The Junior High-Level I program is dealt with in a general basis for the purpose of articulating the two levels within the total secondary school industrial arts program.

Three types of industrial Arts programs are included in the Program of Studies along with the individual courses which constitute the complete secondary school curriculum:

1. **ORIENTATION AND EXPLORATION--** Level I program designed for grades seven through nine.
The purpose of this program is to provide students with first-hand exploratory experiences in the four technical cluster areas. The learning experiences should provide an awareness of the impact of industry and it's associated technologies on the lives of individuals. Furthermore, this program assists individuals in making informed and meaningful occupational/career choices.
2. **PERSONAL ENRICHMENT--** The program designed to prepare students with a general education of technological literacy, avocational skills and consumer information. This is purely an elective program of students for students who desire to gain an understanding of the technical concepts for personal satisfaction.
3. **PRE-TECHNICAL--** This program provides concentrated and specialized technical courses for grades ten through twelve. These courses are articulated with the Level I technical cluster areas. Students at this level have a wide range of interests, abilities, and life aspirations. Therefore, the key element for the senior high pre-technical program is flexibility to meet the varied needs of learners. The program is designed to prepare students for advanced educational or training programs.

The North Dakota Senior High Program of Studies identified twelve different courses recommended to be offered in grades ten, eleven and twelve. The model curriculum lists four courses for each of three technical areas: (1) Energy/power, (2) Graphic Communications, and (3) Production. Individual course guides have been developed for each of the twelve courses recommended for the senior high curriculum. This being one of the twelve course guides. Similar guides have been developed for the remaining eleven.

Each course guide contains the course rationale, objectives, content, units and selected student competencies to be developed along with student learning activities. The primary aim of the course guides is to provide meaningful direction and still leave opportunity for individual teacher creative approaches in meeting the diverse needs of unique school populations. The course guides not only propose to assist teachers and administrators in keeping their programs up-to-date, but also to promote industrial arts education program uniformity among North Dakota schools.



Ernest Breznay
State Industrial Arts Supervisor
North Dakota State Board for Vocational Education
July, 1981

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The North Dakota Industrial Arts profession is indebted to the following individuals who gave their time and talents in the development of the Twelve Senior High Industrial Arts course guides. These teachers and teacher educators attended an Organizational meeting, participated in a curriculum writing seminar, and developed individual course guides during 1980 & 1981.

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Selected Student Competencies &
Sample Learning Activities):

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BASIC BELIEFS ABOUT INDUSTRIAL ARTS

INDUSTRIAL ARTS IS

- *an educational discipline founded upon the knowledge base of technology - the means by which material things are produced.
- *an instructional program affording boundless opportunities for learning how technology has been, is now and will be basic to human desires and needs.
- *a fundamental educational program that can serve educational priorities, whether they are academic education, general education, vocational education, career education, ad. inf.
- *an activity based curriculum enabling students to learn through doing.
- *logically a discipline with a curriculum continuum from grade K through 12.

INDUSTRIAL ARTS IS JUSTIFIED BECAUSE

- *all persons need to know about the technological environment, the material culture, and industry because they are economically, socially and emotionally affected by them.
- *all persons must make a career choice from an extremely large and increasing number of occupations that are affected by technology; therefore, they should have opportunities to develop interests, uncover talents, explore technical and applied science fields and study occupations.
- *all persons must select, buy, use, and maintain the products of industry -- houses, automobiles, appliances, clothes, furniture and items of a never ending list. A knowledge of products, their manufacture, characteristics, advantages and disadvantages makes for intelligent consumption.
- *all persons need recreational, leisure time and avocational outlets.
- *all persons need to have opportunities to develop planning, creative, problem solving and technical skills in harmony with their inherent desire to seek the better way.

INDUSTRIAL ARTS CAN HELP THE STUDENT TO

- *gain an understanding of industry and technology.
- *discover interests and talents.
- *develop techniques in problem solving.
- *develop basic skills in the safe use of tools and machines.
- *make informed and meaningful occupational choices.
- *acquire interests in avocational pursuits and hobbies.
- *develop safe working habits.
- *apply other school subjects.
- *become a wiser consumer.
- *develop creativity.
- *develop pride in work well done.
- *work cooperatively with others.

THE INDUSTRIAL ARTS MISSION

The mission of Industrial Arts Education is to assist the student in developing an understanding about industry and technology and in the discovery and development of individual potential.

GOALS

Consistent with their abilities, interests and educational needs:

1. Industrial Arts students at the middle or junior high school level will be aware of employment and/or self-employment opportunities and requirements for use in making career choices and in determining their educational programs.
2. Industrial Arts students at the senior high school level will acquire technical competencies in preparation for advanced vocational or technical education programs.
3. Industrial Arts students at the senior high school level will acquire competencies that lead to responsible citizenship through technological understanding, consumer knowledge and the productive use of leisure time.

INDUSTRIAL ARTS: AN OFFICIAL DEFINITION

Industrial Arts education programs means those education programs which pertain to the body of related subject matter, or related courses, organized for the development of understanding about the technical, consumer, occupational, recreational, organizational, managerial, social, historical, and cultural aspects of industry and technology including learning experiences involving activities such as experimenting, designing, constructing, evaluating, and using tools, machines, materials, and processes which provide opportunities for creativity and problem solving or assist individuals in the making of informed and meaningful occupational choices or which prepare them for entry into advanced trade and industrial or technical education programs.

INDUSTRIAL ARTS INSTRUCTIONAL OBJECTIVES

Industrial Arts students at the Senior High School Level will acquire competencies that lead to responsible citizenship through technological understanding, consumer knowledge and the productive use of leisure time. The program stresses the following instructional objectives:

1. Develop an insight and understanding of industry and technology, its place in our society and the free enterprise system.
2. Discover and develop individual talents, aptitudes, interests, and potentials as related to industry and technology.
3. Develop an understanding of industrial processes and the practical application of scientific principles.
4. Develop technical problem-solving and creative abilities involving the use of materials, processes, and products of industry and technology.
5. Develop an understanding of industrial and technological career opportunities and their requirements and develop those traits which will help students obtain and maintain employment.

As determined by Title II of PL No. 94-482, the Vocational Education Act of 1976 and the State Board for Vocational Education, the purpose of funding industrial arts programs with vocational monies will be to:

1. Assist individuals in the making of informed and meaningful occupational and educational choices.
2. Prepare individuals for enrollment in advanced or highly skilled vocational and technical programs.

NORTH DAKOTA INDUSTRIAL ARTS CURRICULUM

Program Scope and Sequence Model

JUNIOR HIGH LEVEL I
(7-9)

Orientation and Exploration

ELEMENTARY LEVEL
(k-6)
Awareness

SENIOR HIGH LEVEL II
(10-12)

Personal Enrichment
Pre-Technical

At the elementary level, learning experiences in Industrial arts will be directed primarily toward the child's development of an awareness of industry/technology and the world of work. The concepts and activities will be integrated with the elementary curriculum to enrich and reinforce the common learning areas.

INSIGHTS INTO
INDUSTRY &
TECHNOLOGY

A broad overview of industry and technology. Learning experiences will be directed toward the student's exploration of the historical, present, and future potentials of industry and technology.

GRAPHIC
COMMUNICATIONS
TECHNOLOGY

MANUFACTURING
TECHNOLOGY

CONSTRUCTION
TECHNOLOGY

ENERGY/POWER
TECHNOLOGY

DESIGN/DRAFTING
PHOTOGRAPHY
GRAPHIC ARTS
CONSTRUCTION
DRAFTING
INDIVIDUAL TECHNICAL
PROBLEMS

PRODUCTION

WOOD TECHNOLOGY
PLASTIC TECHNOLOGY
METAL TECHNOLOGY
INDUSTRIAL CRAFTS
INDIVIDUAL TECHNICAL
PROBLEMS

ENERGY SOURCES
POWER TECHNOLOGY
ELECTRICAL / ELEC-
TRONIC TECHNOLOGY
TRANSPORTATION
TECHNOLOGY
INDIVIDUAL TECHNICAL
PROBLEMS

THE INDUSTRIAL ARTS PROGRAM OF STUDIES

LEVEL	GOAL	PROGRAM
II HIGH SCHOOL (Grades 10, 11, & 12)	1. Personal Enrichment 2. Pre-Technical	GRAPHIC COMMUNICATIONS TECHNOLOGY *Design/Drafting *Photography *Graphic Arts *Construction Drafting *Industrial Technical Problems ENERGY/POWER TECHNOLOGY *Energy Sources *Power Technology *Electrical/Electronic Technology *Transportation Technology *Individual Technical Problems PRODUCTION TECHNOLOGY *Wood Technology *Metal Technology *Plastic Technology *Industrial Crafts *Individual Technical Problems INDIVIDUAL TECHNICAL PROBLEMS (Multiple Offerings)
I JUNIOR HIGH SCHOOL (Grades 7, 8, & 9)	1. Orientation 2. Exploration	*Insights into Industry and Technology *Graphic Communications Technology *Manufacturing Technology *Construction Technology *Energy/Power Technology

PROGRAM STANDARDS FOR INDUSTRIAL ARTS

ELEMENTS OF QUALITY INDUSTRIAL ARTS PROGRAMS

The success and quality of programs in industrial arts education depends upon elements that influence the quality of programs. Industrial arts must be responsive to the following elements:

- A. GOALS AND OBJECTIVES:** Program goals and objectives are established that provide the inspiration and guidance in program development, operation and evaluation.
- B. INSTRUCTIONAL STAFF:** The instructional staff is competent and meet necessary qualifications.
- C. INSTRUCTIONAL PLAN:** Selected subject matter is appropriate to learner's level and consistent with curriculum and course goals and objectives.
- D. STUDENT ORGANIZATIONS:** The establishment and operation of effective student organizations.
- E. FACILITIES AND EQUIPMENT:** Instructional facilities are well-designed, located and supportive of accomplishing curricular goals. (Refer to Educational Specifications for Industrial Arts Instructional Facilities Handbook, 1978.)
- F. SPECIAL NEEDS:** The program must provide for disadvantaged and handicapped students.
- G. ADVISORY COMMITTEES:** The establishment and effective use of industrial arts advisory committees.
- H. GUIDANCE:** The teacher's role in guidance.
- I. ADMINISTRATION:** Administration of the industrial arts program.
- J. EVALUATION:** Evaluation procedures are planned and implemented to assure continual program improvement.

NOTE: For further information on program standards, refer to the NORTH DAKOTA VOCATIONAL/ TECHNICAL EDUCATION PROGRAM STANDARDS, Section 11.1 to 11.7.

INDUSTRIAL ARTS COURSE CODE NUMBERS (Vocationally Funded)

Insights Into Industry and Technology	10001
Construction Technology	10011
Manufacturing Technology	10021
Wood Technology	10023
Metal Technology	10026
Plastic Technology	10029
Energy and Power Technology	10031
Electrical/Electronic Technology	10033
Energy Sources	10038
Power Technology	10039
Graphic Communications Technology	10051
Graphic Arts	10052
Design/Drafting	10053
Photography	10054
Construction Drafting	10056
Transportation	10061
Industrial Crafts	10067
Individual Technical Problems	10091
Individual Technical Problems	10092

PART II:
INDUSTRIAL CRAFTS
COURSE GUIDE

(# 10080)

INDUSTRIAL CRAFTS

Rationale:

Industrial Crafts is an important area of study in the industrial arts curriculum for several reasons. First, the industrial crafts course allows students to experience a variety of materials, tools and processes representative of their industrial and technological culture. Second, the course provides experiences which apply those industrial craft materials, tools and processes in the design and production of real-life industrial craft products, a gain through representative industrial activities. Third, and perhaps most important, the industrial crafts course permits students the opportunity to study numerous avocational elements in their modern culture. Among these avocational elements, all of which may not be available for study elsewhere in the school curriculum are; recreation, hobby and general leisure time experiences, consumer knowledge, and general technological knowledge, all which will assist students in becoming productive and responsible adults.

Course Objectives:

The course provides the following specific instructional objectives:

1. Develop an insight and understanding of the craft industry, its place in our society and the free enterprise system.
2. Develop problem solving and creative abilities by creating well-designed products.
3. Develop an understanding of industrial processes and the practical application of scientific principles.
4. Develop technical problem solving involving the use of materials.
5. Develop an understanding of craft career opportunities and the requirements and develop those traits which will help students obtain and maintain employment.
6. Assist individuals in making informed and meaningful occupational and educational choices.
7. Prepare individuals for enrollment in advance or highly skilled vocation and technical programs.

Guidelines For Implementation

Success in the classroom or laboratory depends on many factors. Foremost among these is the planning effort on the part of the teacher. Educational programs must be flexible and adaptable. They must be flexible enough to remain adaptable to all locales, in numerous types of facilities, and with students possessing differing values and interest. Therefore, a successful program must be capable of application in both small and large schools.

The industrial arts program recommended by these course guides are designed to meet individual student needs. They provide teachers with guidelines for a well balanced program with suggested teacher options in each of the three major technical study areas: (1) Graphic Communications; (2) Energy/Power; and (3) Production. The North Dakota secondary school industrial arts program suggests three levels of learning with an alternative curriculum approach at the Level II for those schools that cannot offer specific courses identified for each of the three technical study areas due to the size of enrollments or other limiting factors.

Production Technical Area Guidelines

The recommended scope and sequence of course offerings for the production technical study area is illustrated on the sample program model on page 13. The Level I courses (Manufacturing Technology and Construction Technology) are recommended as prerequisites for the production courses listed at Level II. The senior high Level II courses provide concentrated and indepth exploratory experiences in four production courses: (1) Wood Technology; (2) Metal Technology; (3) Plastic Technology; and (4) Industrial Crafts. Since students at the high school level display a wide range of interests, abilities, and life goals, the industrial arts program must provide a variety of learning experiences and options to meet individual needs. To meet the varied student needs, it is recommended that the specific courses be made available to students when possible. For the smaller and mid-sized schools, it may not be feasible to offer all four of the specific production courses identified for Level II. If that should be the case, it is recommended that one or two of the courses be offered and an ITP (Individual Technical Problems) course be offered as a Level II alternative. (See ITP Course specifications on page 14). This course is designed to provide multiple experiences in production to meet individual needs.

The Level III ITP course (Code #10093) is suggested for students in larger programs who have had the Level II indepth exploratory courses in the production area and desire to study a specialized aspect related to industrial materials, production processes, and/or production organization. (See pages 15 and 16 for specific Level III ITP Course specifications and study options).

Guidelines For Implementing the Industrial Crafts Course

1. Identify personnel who aid in curriculum change, development and implementation.
2. Identify and gain support of administration, civic and parent organizations.
3. Arrange for a detailed presentation of the program to key personnel.
4. School systems should make the program universal throughout all senior high schools Level II, it two or more.
5. Arrangements should be made for the purchase of software and hardware.
6. Arrangements should be made for inservice preparation of all teachers of the production technology program.
7. Scheduling of instructional units may be adjusted to accommodate students and instructional year.

LEVEL I

CONSTRUCTION TECHNOLOGY
(CODE # 10011)

MANUFACTURING TECHNOLOGY
(CODE # 10021)

LEVEL II

WOOD
TECHNOLOGY
(10023)

METAL
TECHNOLOGY
(10026)

PLASTIC
TECHNOLOGY
(10029)

INDUSTRIAL
CRAFTS
(10080)

LEVEL II
(ALTERNATE)

CONSTRUCTION TECHNOLOGY
MANUFACTURING TECHNOLOGY

INDIVIDUAL TECHNICAL PROBLEMS
(SEE COURSE # 10091 SPECIFICATIONS - P. 14)

LEVEL III
(SPECIALIZED)

CONSTRUCTION TECHNOLOGY
MANUFACTURING TECHNOLOGY

INDIVIDUAL TECHNICAL PROBLEMS
(SEE COURSE # 10092 SPECIFICATIONS - P. 15)

Sample Program Model

INDIVIDUAL TECHNICAL PROBLEMS

COURSE CODE: 10091

This individual technical problem course is designed for students who have not had the opportunity to enroll in specific Level II subject matter courses in the Production Technology cluster area. The course is designed to provide a means for meeting individual student needs through the offering of multiple activities in a number of technical areas in schools where separate courses are not available.

INDUSTRIAL ARTS PURPOSE Personal Enrichment Pre-Technical	SELECTED STUDENT COMPETENCIES NOTE: Individual student competencies and learning experiences are to be identified and developed on a contractual basis by the student and approved by the instructor for each problem. SAMPLE LEARNING TOPICS NOTE: Learning topics for the ITP are to be selected from the instructional units identified for each specific subject matter course. These courses include: PRODUCTION TECHNOLOGY: -- Wood Technology, 10023 -- Metal Technology, 10026 -- Plastic Technology, 10029 -- Industrial Crafts, 10080
GRADE LEVEL 11 - 12	
COURSE LENGTH One period per day 18 or 36 weeks	
UNIT OF CREDIT $\frac{1}{2}$ or 1 unit	
RECOMMENDED PREREQUISITES Level I Curriculum Courses	

INDIVIDUAL TECHNICAL PROBLEMS: PRODUCTION

COURSE CODE: 10092

This individual technical problem course is designed for students who have had the Level II preliminary course of this cluster in the chosen area of study and intend to study specific information and techniques in wood, plastic, metal technology courses and/or industrial crafts.

INDUSTRIAL ARTS PURPOSE Personal Enrichment Pre-Technical	Instruction in this industrial arts course is open to meet student needs. The following suggested objectives are meant to provide ideas for developing students programs. 1. To prepare students for seeking advanced education in the area of production. 2. To provide students the experiences in problem-solving, research and development with regard to any specific topic in production courses. 3. To provide students with information regarding industrial materials, processes and the practical applications of scientific principles. 4. To provide students with an understanding of industry, it's place in society, and the free enterprise system. 5. To provide students with an understanding in related career opportunities in production.
GRADE LEVEL 11 - 12	
COURSE LENGTH One period per day 18 or 36 weeks	
UNIT OF CREDIT $\frac{1}{2}$ or 1 unit	
RECOMMENDED PREREQUISITES Level I Curriculum Courses and Le	

INDIVIDUAL TECHNICAL PROBLEMS:

PRODUCTION

SAMPLE LEARNING UNITS

WOOD TECHNOLOGY:

- I. Anatomical Structure of Wood
- II. Forest Ecology
- III. Physical Nature of Wood
- IV. Wood Defects
- V. Lamination Processes
- VI. Peg Diffusion
- VII. Wood Plastic Composition
- VIII. Residential Construction
 - A. Sub-structure
 - B. Super-structure
- IX. Commercial Construction
- X. Wood By-Products
- XI. Product Design
- XII. Product Finishing
- XIII. Preservation Materials
- XIV. Occupations - Present and Future
- XV. Safety Development
- XVI. Prototype Construction
- XVII. Bending Fixtures

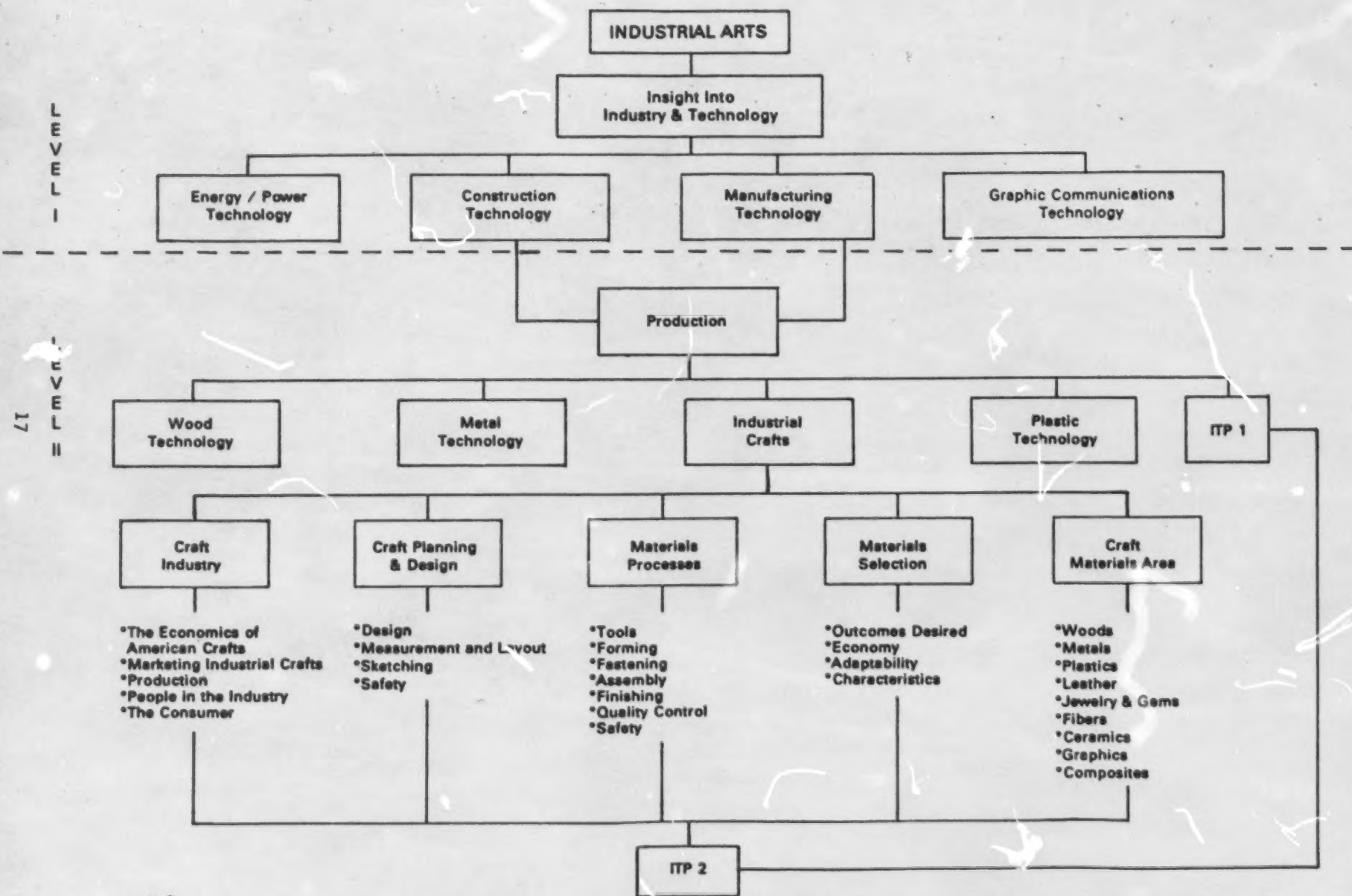
METAL TECHNOLOGY:

- I. EDM
- II. Chemical Milling
- III. Explosive Forming
- IV. Adhesives
- V. Investment Casting
- VI. Forging
- VII. Heat Treatment of Metals
- VIII. Metal Turning
- IX. Extrusion Processes
- X. Powder Metallurgy
- XI. Multi-Related Problems
- XII. Automation
- XIII. Accident Prevention Study

PLASTIC TECHNOLOGY:

- I. Mold Construction
 - A. Expandable Bead Molds
 - B. Liquid Plastic Molding
 - C. Vacuum Forming Molds and Rotational
- II. Decorating and Finishing Applications of Plastic
 - A. Advertising
 - B. Natural Finishes

- III. Study Developments of Future Applications of Plastic
- IV. Uses of and Choices of Bonding Agents
- V. Plastic Products
 - A. Production of Plastic Products
 - B. Study of Industrial Processes
- VI Study of Optical Properties
- VII. Plastic Products
- VIII. Safety and Health Hazards of Toxic Fumes From Plastic Materials



INDUSTRIAL CRAFTS

COURSE CODE: 10080

The industrial crafts program allows students to experience a variety of materials, while creating well-designed and useful objects. Students develop competencies in using selected tools and processes of the industrial crafts area while developing products.

INDUSTRIAL ARTS PURPOSE	SELECTED STUDENT COMPETENCIES
Personal Enrichment	Experiences and activities of this industrial arts course will enable the student to:
GRADE LEVEL	1. Study the crafts industry to determine the present status in our society and the future opportunities that might be available.
10 - 12	2. Identify different production techniques used in the industrial crafts.
COURSE LENGTH	3. Identify and describe the personnel that make up this industry.
One period per day	4. Demonstrate an ability to design industrial craft products.
18 weeks	5. Practice safe work habits when using the tools of the craft industry.
UNIT OF CREDIT	6. Identify and perform industrial crafts processes, such as forming, fastening, assembling, and finishing.
½ unit	7. Practice quality control during the production of a product.
RECOMMENDED PREREQUISITES	8. Demonstrate problem-solving and creative abilities in the selection and use of suitable materials.
None	9. Demonstrate cooperative attitudes and good work habits.
	10. Produce industrial craft products of quality and craftsmanship.
	11. Identify craft areas and their contribution to the American economy and culture.

10080
Course Code

INDUSTRIAL CRAFTS

Suggested Instructional Units

	Class Periods	
	(18 wks)	(36 wks)
I. Craft Industry	5	
II. Craft Planning and Design	15	
III. Materials Processes	30	
IV. Materials Selection	20	
V. Craft Materials Areas	20	
TOTAL	90	

UNIT I

Craft Industry

OBJECTIVES:

This unit is meant to provide the students with:

1. An understanding of the economics of crafts.
2. An understanding of the production and potential market for crafts.
3. An insight between the personnel in industry and the consumer.

1.0.0 The Craft Industry

1.1.0 The economics of American Crafts

- 1.1.1 The development of American Craft as an economic force
- 1.1.2 Available markets
- 1.1.3 Craftwork as an occupation

1.2.0 Marketing industrial crafts

1.2.1 Advertising

- 1.2.1.1 Posters
- 1.2.1.2 Radio
- 1.2.1.3 T.V.
- 1.2.1.4 Newspaper
- 1.2.1.5 Craft shows

1.2.2 Sales

- 1.2.2.1 Crafts shows
- 1.2.2.2 Hobby marts
- 1.2.2.3 Drug stores

1.3.0 Production

1.3.1 Individual

- 1.3.1.1 Home
- 1.3.1.2 Small shop
- 1.3.1.3 Recreational

1.3.2 Collective work

- 1.3.2.1 Small shop
- 1.3.2.2 Limited production

UNIT I

1.3.3 Mass production

- 1.3.3.1 Assembly line
- 1.3.3.2 Unlimited production

1.3.4 Craft cooperatives

- 1.3.4.1 Percentage type production

1.4.0 People in the industry

1.4.1 Creativity

- 1.4.1.1 Originality
- 1.4.1.2 Modification
- 1.4.1.3 Transformation

1.4.2 Individualism

- 1.4.2.1 Self Expression

1.4.3 Age span

- 1.4.3.1 Types of crafts

1.4.4 Education and training required

- 1.4.4.1 Informal education
- 1.4.4.2 Formal education
- 1.4.4.3 Apprentice
- 1.4.4.4 Experience

1.4.5 Physical attributes

- 1.4.5.1 Patience
- 1.4.5.2 Dexterity
- 1.4.5.3 Good eye sight

1.5.0 The consumer

SELECTED STUDENT COMPETENCIES AND SAMPLE LEARNING ACTIVITIES FOR

Industrial Crafts

UNIT I: The Crafts Industry

SELECTED STUDENT COMPETENCIES

SAMPLE LEARNING ACTIVITIES

THE LEARNING ACTIVITIES SHOULD
ENABLE THE STUDENT TO:

- A. Contrast the craft industry as it relates to the development of the American craft as an economic force the availability of markets and the craft work as an occupation.
- B. Identify the means of marketing industrial crafts through advertising and sales.
- C. Compare the various means of production of craft articles and method of consignment.

Compare the style of the people in the craft industry as to the creativity, individualism, age span, educational training and physical attributes.

Identify the personal style preferences of the consumer.

- A.1 Read and discuss the crafts area as a means of making a living, investigate available markets, discuss a career in industrial craft.
- B.1 Visit a craft shop, hobby mart or other business where crafts are sold and compare prices of craft products available.
- C.1 Collect posters and newspaper ads, discuss the use of radio and TV commercials, and list several outlets for craft products. Discuss the various means of production, e.g., individual collective, mass production and craft cooperatives.
- C.2 The students will examine and discuss the style and forms of craft products, e.g., creativity, individualism or self expression, age groups, educational backgrounds and training, and physical attributes.
- C.3 The student will examine different styles of craft products and make a personal choice of a craft product and discuss why he/she made that particular choice.

UNIT II

Craft Planning and Design

OBJECTIVES:

This unit is meant to provide the students with:

1. An understanding and ability to design industrial craft products.
2. An ability for accurate measurement and layout.
3. Safe work habits.

1.0.0 Craft Planning and Design

1.1.0 Design

1.1.1 New and original

1.1.1.1 Design requirements

1.1.1.1.1 Function

1.1.1.1.2 Material

1.1.1.1.3 Visual

1.1.2 Design integrity

1.1.2.1 Material

1.1.3 Discrimination

1.1.3.1 Mixing of style

1.1.4 Quality

1.1.4.1 Design

1.1.4.2 Material

1.1.4.3 Fabrication

1.1.4.4 Finish

1.1.5 Elements and principle

1.1.5.1 Lines

1.1.5.2 Planes

1.1.5.3 Solids

1.1.5.4 Surfaces

1.1.5.5 Unity

1.1.5.6 Variety

1.1.5.7 Balance

1.1.5.8 Proportion

UNIT II

1.2.0 Measurement and layout

- 1.2.1 English system
- 1.2.2 SI (international system of units) metrics
- 1.2.3 Layout tools
 - 1.2.3.1 Rule
 - 1.2.3.2 Steel tape
 - 1.2.3.3 3 foot rule
 - 1.2.3.4 Framing square
 - 1.2.3.5 Combination square
 - 1.2.3.6 Try square
 - 1.2.3.7 Awl
 - 1.2.3.8 Dividers
 - 1.2.3.9 Compass
 - 1.2.3.10 Patterns and templates

1.3.0 Sketching

- 1.3.1 Alphabetical lines
- 1.3.2 Orthographic
- 1.3.3 Pictorial
 - 1.3.3.1 Perspective
 - 1.3.3.2 Isometric
 - 1.3.3.3 Oblique
 - 1.3.3.3.1 Calvier
 - 1.3.3.3.2 Cabinet

1.3.4 Working Drawings

- 1.3.4.1 Dimensioning
- 1.3.4.2 Lettering

1.4.0 Safety

- 1.4.1 Lab housekeeping
- 1.4.2 Combustable materials
- 1.4.3 Proper use of tools
- 1.4.4 Unsafe behavior
- 1.4.5 Personal Safety
 - 1.4.5.1 Clothing
 - 1.4.5.2 Eye protection
- 1.4.6 Buddy system

SELECTED STUDENT COMPETENCIES AND SAMPLE LEARNING ACTIVITIES FOR

Industrial Crafts

UNIT II: Craft Planning and Design

SELECTED STUDENT COMPETENCIES

SAMPLE LEARNING ACTIVITIES

**THE LEARNING ACTIVITIES SHOULD
ENABLE THE STUDENT TO:**

A. Design a craft item incorporating the design requirements, integrity, discrimination, quality and elements and principle of good design and planning.

A.1 Students will design a craft project using the proper design requirement such as, function, material and visual.

A.2 Students will measure selected objects in specified units.

B. Compare the English system to systems of international metrics by using the various layout tools.

B.1 Students will also incorporate its elements and principle of design such as, unity, variety, balance and proportion.

B.2 Students will identify standard measuring tools, e.g., rule, steel rule, 3 foot rule, framing square, combination square, try square, awl, dividers, compass, and patterns and templates.

C. Design a craft item by sketching, using the alphabet of lines, orthographic projection and pictorial drawings.

C.1 Students will sketch a craft item using the alphabet of lines.

C.2 Produce pictorial and orthographic drawings.

C.3 Draw a set of working drawings for a craft item.

**SELECTED STUDENT COMPETENCIES
AND SAMPLE LEARNING ACTIVITIES
FOR**

Industrial Crafts

UNIT II: Craft Planning and Design

SELECTED STUDENT COMPETENCIES

SAMPLE LEARNING ACTIVITIES

**THE LEARNING ACTIVITIES SHOULD
ENABLE THE STUDENT TO:**

- D. List the safety habits in crafts as they pertain to laboratory housekeeping combustible materials, proper use of tools, horse-play, personal habits and the buddy system.

- D.1 Students will discuss the safety rules and habits in the craft lab.
- D.2 Students will wear proper clothing at all times.
- D.3 Students will work in the lab with a buddy.

UNIT III

Materials and Processes

OBJECTIVES:

This unit is meant to provide the students with:

1. The ability to identify the tools used in industrial crafts.
2. The ability to perform industrial craft processes.
3. The ability to perform industrial craft processes safely.

1.0.0 Materials and Processes

1.1.0 Tools of the trade

1.1.1 Woodworking tools

1.1.1.1 Hand tools

1.1.1.2 Machines

1.1.2 Metal tools

1.1.2.1 Hand tools

1.1.2.2 Metal machines

1.1.3 Leather tools

1.1.3.1 Carving

1.1.3.2 Punching

1.1.3.3 Stamping

1.1.4 Plastic tools

1.1.4.1 Special plastic forming tools

1.1.4.1.1 Autoclave

1.1.4.1.2 Vacuum form

1.1.4.1.3 Rotational molding machine

1.1.4.1.4 Laminating press

1.1.4.1.5 Molds

1.1.5 Lapidary tools

1.1.6 Drafting tools

1.1.7 Photographic equipment

1.1.8 Kilns

1.2.0 Forming

UNIT III

- 1.2.1 Casting or molding
- 1.2.2 Compressing or sketching
- 1.2.3 Conditioning
- 1.3.0 Separating
 - 1.3.1 Chip removal
 - 1.3.2 Shearing
 - 1.3.3 Chemical erosion
 - 1.3.4 Thermo erosion
- 1.4.0 Fastening
 - 1.4.1 Mechanical
 - 1.4.2 Chemical
- 1.5.0 Assembly
 - 1.5.1 Sub-assembly
 - 1.5.2 Final assembly
- 1.6.0 Finishing
 - 1.6.1 Painting
 - 1.6.2 Anodizing
 - 1.6.3 Sanding
 - 1.6.4 Sandblasting
 - 1.6.5 Tumbling
 - 1.6.6 Electroplating
 - 1.6.7 Rubber coating
- 1.7.0 Safety

SELECTED STUDENT COMPETENCIES AND SAMPLE LEARNING ACTIVITIES FOR

Industrial Crafts

UNIT III: Materials and Processes

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO: A. Identify the processes used to create a craft articles, through the use of woodworking, metal, leather, plastic, and lapidary tools. Construct a craft project by forming. List the different ways of separating. Compare fastening methods. Identify assembly procedures. Identify the several finishing methods used in the craft industry. Contrast the methods of quality control as it relates the quality of the finished craft items.	A.1 Students will perform and identify the tools used in the craft industry. They will list the tools needed and use the proper tools. A.2 Students will form an item by casting or molding, compressing or sketching and conditioning. A.3 Students will separate material by chip removal, shearing, chemical erosion, and thermal erosion. A.4 Students will combine material by mechanical and chemical methods. A.5 Students will construct sub assemblies and final assembly. A.6 Students will properly finish the craft item by one of the finishing procedures, e.g., painting, anodizing, sanding, sand-blasting, tumbling, electra-plating, and rubber coating. A.7 Students will practice quality control by producing a good craft item.

**SELECTED STUDENT COMPETENCIES
AND SAMPLE LEARNING ACTIVITIES
FOR**

Industrial Crafts

UNIT III: Materials and Processes

SELECTED STUDENT COMPETENCIES

SAMPLE LEARNING ACTIVITIES

THE LEARNING ACTIVITIES SHOULD
ENABLE THE STUDENT TO:

- B. List the safety measures in crafts as they pertain to laboratory housekeeping, combustible material, proper use of tools, unsafe behavior, personal habits and the buddy system.

- A.8 Students will discuss the safety rules and procedures in the craft lab.
- B.1 Students will dress properly at all times.
- B.2 Students will work in the lab with a buddy.

UNIT IV

Materials Selection

OBJECTIVES:

This unit is meant to provide the student with:

1. The ability to select suitable materials to reach a desired outcome.
2. A knowledge of economics in material selection.
3. The ability to produce craft products of quality and craftsmanship.

1.0.0 Materials Selection

1.1.0 Outcomes desired

1.1.1 Suitable materials for project

1.2.0 Economy

1.2.1 Waste products

1.2.2 Inexpensive materials

1.3.0 Adaptability

1.3.1 Suitable to change

1.4.0 Characteristics

1.4.1 Mechanical properties

1.4.2 Physical properties

1.4.3 Color

1.4.4 Texture

**SELECTED STUDENT COMPETENCIES
AND SAMPLE LEARNING ACTIVITIES
FOR**

Industrial Crafts

UNIT IV: Materials Selection

SELECTED STUDENT COMPETENCIES

**THE LEARNING ACTIVITIES SHOULD
ENABLE THE STUDENT TO:**

- A. Demonstrate problem solving
and creative abilities in
the selection and use of
suitable materials.**

SAMPLE LEARNING ACTIVITIES

- A.1 Students will create a
craft item using the
proper material to reach
the desired outcome.**
- A.2 Students will use materials
that are inexpensive, have
adaptability and the proper
characteristics, e.g.,
use waste products, use
products that are suitable
to change, and have the
correct properties for the
item designed.**

UNIT V

Craft Materials Area

OBJECTIVES:

This unit is meant to provide the student with:

1. The ability to identify craft areas and be able to work with and produce products with each area.
2. A knowledge of the contribution to the American economy and culture.

1.0.0 Craft Materials Area

1.1.0 Metals

- 1.1.1 Sinking, raising and tooling
- 1.1.2 Enameling and etching
- 1.1.3 Scrollwork
- 1.1.4 Casting
- 1.1.5 Coloring

1.2.0 Wood

- 1.2.1 Carving trays and bowls
- 1.2.2 Whittling
- 1.2.3 Fragmented silhouette carving
- 1.2.4 Flat wall carving
- 1.2.5 Wood jewelry
- 1.2.6 Sterilized full carving
- 1.2.7 Driftwood

1.3.0 Plastics

- 1.3.1 Plastic sculpture
- 1.3.2 Fiberglass laminating
- 1.3.3 Casting
- 1.3.4 Granular forming
- 1.3.5 Decorative laminate
- 1.3.6 Sheet working

1.4.0 Leather

- 1.4.1 Tooling
- 1.4.2 Carving (wet and dry)
- 1.4.3 Stamping
- 1.4.4 Invested silhouette carving
- 1.4.5 Lacing

UNIT V

1.5.0 Jewelry and gems

- 1.5.1 Cutting
- 1.5.2 Tumbling and polishing
- 1.5.3 Setting
- 1.5.4 Casting
- 1.5.5 Forming

1.6.0 Fibers

- 1.6.1 Weaving
- 1.6.2 Tie dying
- 1.6.3 Batik
- 1.6.4 Needle point
- 1.6.5 Hooking

1.7.0 Ceramics

- 1.7.1 Glass etchers
- 1.7.2 Stained glasscraft
- 1.7.3 Slumped glass
- 1.7.4 Mosaic tile
- 1.7.5 Clay work

1.8.0 Graphics

- 1.8.1 Linoleum block printing
- 1.8.2 Silk screen printing
- 1.8.3 Paper cut silhouettes
- 1.8.4 Decorative models

1.9.0 Composites

- 1.9.1 Combining of materials

SELECTED STUDENT COMPETENCIES AND SAMPLE LEARNING ACTIVITIES FOR

Industrial Crafts

UNIT V: Craft Materials Area

SELECTED STUDENT COMPETENCIES

SAMPLE LEARNING ACTIVITIES

THE LEARNING ACTIVITIES SHOULD
ENABLE THE STUDENT TO:

- A. Construct a craft product in metals by sinking, raising, tooling, enameling, etching, scrollwork, casting and coloring.

- A.1 Student will select and produce using the various materials in the metal area, e.g., spinning a dish, raising and tooling aluminum and copper. Copper enameling/aluminum etching, beading, and joining scrolls and sand casting.

Construct a craft product in woods using the several methods, carving, whittling fragmented silhouette, flat wall carving, jewelry, stylized full carving and driftwood.

- A.2 Students will perform many operations in producing a craft item from wood, e.g., carving a candy dish, whittling a figurine, assemble a silhouette from wood chips, carve a wall plaque, carve lapel pins, driftwood.

Design and produce a craft product using plastic sculptures, fiberglass laminating, plastic casting, granules forming, decorative laminates, and sheet plastic.

- A.3 Students will design and produce craft items from the different kinds of plastic materials.

Design and process craft items using leather.

- A.4 Students will prepare leather for a small leather project including wetting, tooling, carving, stamping, invested silhouette carving lacing.

SELECTED STUDENT COMPETENCIES AND SAMPLE LEARNING ACTIVITIES FOR

Industrial Crafts

UNIT V: Craft Materials Area

SELECTED STUDENT COMPETENCIES

SAMPLE LEARNING ACTIVITIES

THE LEARNING ACTIVITIES SHOULD
ENABLE THE STUDENT TO:

Design and process craft
items in jewelry and gems.

A.5 Final gems, cut, tumble,
polish, and set a piece of
jewelry such as, a ring or
pin. They will form the
metal and use one of the
process to complete the
product.

Identify and process a craft
product using fibers.

A.6 Students will identify the
different fiber process
and complete a product in
crafts, e.g., tie dying
a T-shirt, weave a simple
basket, batch a shirt, do
needle point design and
hooking a wall picture.

Design and process a craft
product in ceramics using
several methods such as,
glass etching, stained glass
craft, mosaic tile and clay-
work.

A.7 Students will prepare and
process a product in each
of the ceramic areas,
e.g., etch a glass, cut and
assemble a stained glass
container, layout and fix
mosaic tile, and form a
fire clay product.

Design and process graphics
including linoleum block
printing, silk screen print-
ing, paper cut silhouettes an
and decorative models.

A.8 Students will design and
cut a linoleum block,
design, cut, adhere and
print a silk screen, cut
paper silhouettes, and make
decorative models.

Design and process a craft
product combining materials.

A.9 Students will construct a
craft using several of
the materials suggested.

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